

## BURROWING AND DENNING HABITS OF A CAPTIVE COLONY OF THE UTAH PRAIRIE DOG

Harold J. Egoscue<sup>1</sup> and Elizabeth S. Frank<sup>2</sup>

ABSTRACT.— Burrows, hibernaculums, and nests of an exhibit colony of the Utah prairie dog, *Cynomys parvidens*, are described.

Little has been published about the burrowing and denning habits of white-tailed prairie dogs (Subgenus *Leucocrossuromys*). Longhurst (1944) described and diagrammed four burrows of *Cynomys g. gunnisoni*, which contained no hibernating animals, and Clark (1977) described two burrows of *C. leucurus*, one of which was only partially excavated but thought to contain a hibernating prairie dog. As noted by Pizzimenti and Collier (1975), the burrows of the Utah prairie dog, *C. parvidens*, have not been investigated.

### METHODS

An earth-filled, circular, fenced enclosure 14.6 m in diameter containing a colony of seven Utah prairie dogs at the National Zoological Park, Washington, D.C., was excavated in October and November 1978 after the animals had become completely inactive aboveground. A concrete footing that extended almost 2.75 m belowground and an unmortared brick bottom provided drainage but prevented the animals from burrowing out.

Utah prairie dogs had occupied the exhibit since 1971; their numbers varied from 6 to 18 animals (average about 8). At least seven litters of young were raised. The 1975 crop of 10 young was sent to Hogle Zoological Garden, Salt Lake City, Utah; otherwise all young were left in the colony.

Excavation was done in two stages: (1) by digging along the burrows until all that could be located were uncovered and mapped, and (2) by carefully removing the remaining dirt, mostly by pick and shovel, until all animals were found.

### RESULTS AND DISCUSSION

The entrances and upper level tunnels shown in Figure 1 represent the cumulative efforts of several generations of animals over 7.5 years of habitation. There were two types of burrows: (1) deep, permanent, usually but not always interconnected systems many meters long, with several entrances, nest chambers, and "turn-arounds" (near some but not all entrances), where the occupants slept, reared young, sought shelter, and hibernated; and (2) short, shallow, usually unbranched tunnels open at both ends, and less than 1.8 m long that seemed to be used mainly for emergency hiding places. Although some of the latter were maintained in good repair for more than a year, none was enlarged into a main burrow or subsequently became part of an existing main burrow. All these simple burrows were located close to or against the concrete footing and may have represented artifacts of captivity.

None of the upper-level tunnels shown in Figure 1 led to hibernaculums. Apparently passages to deeper levels where the hibernating animals were later discovered were plugged, probably where they branched from the shallower levels and were overlooked. Three chambers containing old nests in varying stages of decay were located at the ends of short unplugged side tunnels 46–61 cm off main tunnels and at depths of 61, 71, and 79 cm below ground level. Two of these measured about 25 x 25 x 28 and 25 x 20 x 25 cm and were almost globular. Since all were at or above the frost line (about 76.2 cm below the surface in this part of Washington,

<sup>1</sup>297 West Durfee Street, Grantsville, Utah 84029.

<sup>2</sup>National Zoological Park, Washington, D.C. 20008.

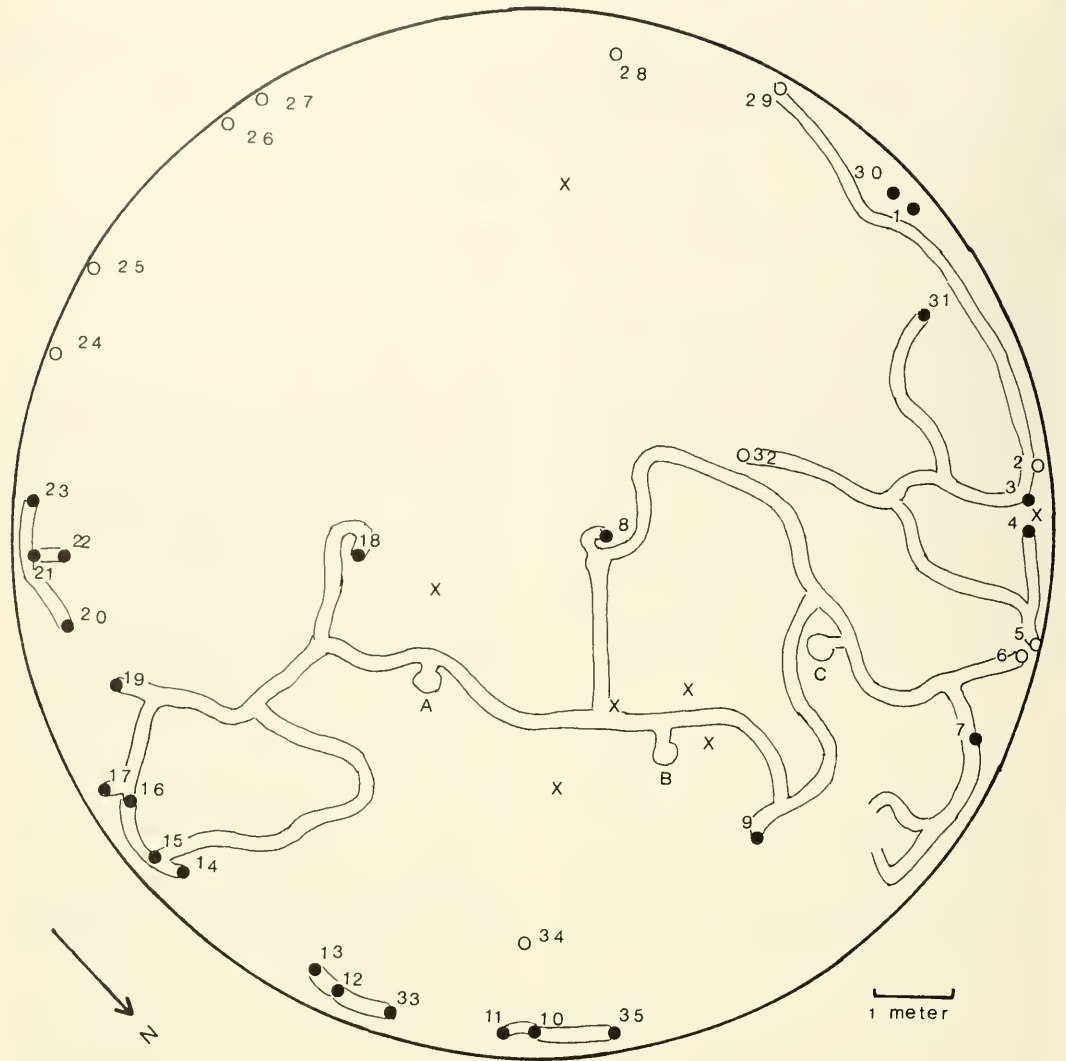


Fig. 1. Diagram of Utah prairie dog enclosure showing (1) den entrances (solid circles = active entrances, open circles = inactive and abandoned entrances); (2) all upper-level burrows (width not to scale); (3) locations of nests in upper-level burrows (capital letters); and (4) positions of nests at deeper levels where hibernating animals were found (X's). Diameter of enclosure was 14.56 m.

D.C.), it was assumed they were not used for hibernation.

Nests occupied by hibernating animals were found 107, 122, 135, 142, and 208 cm below the surface. The smallest chamber measured 22 x 24 x 24 and the largest 28 x 25 x 30 cm. Each was filled to capacity with dry plant material (Fig. 2) gathered from the surface. The innermost materials in contact with the occupant's body were finely shredded. The dirt below each nest was dry and powdery to a depth of about 2 cm and slightly

warm to the touch. The deepest hibernaculum was about 0.6 m from the bottom. We found no tunnels or nests in contact with the bricks. The nests contained no fecal material or ectoparasites.

When located, two of the seven animals were completely inactive, three were in early stages of arousal but still in their nests and unable to make coordinated movements, and the last two were not only fully awake but also sought to evade capture. Our prolonged digging activities may have aroused the latter

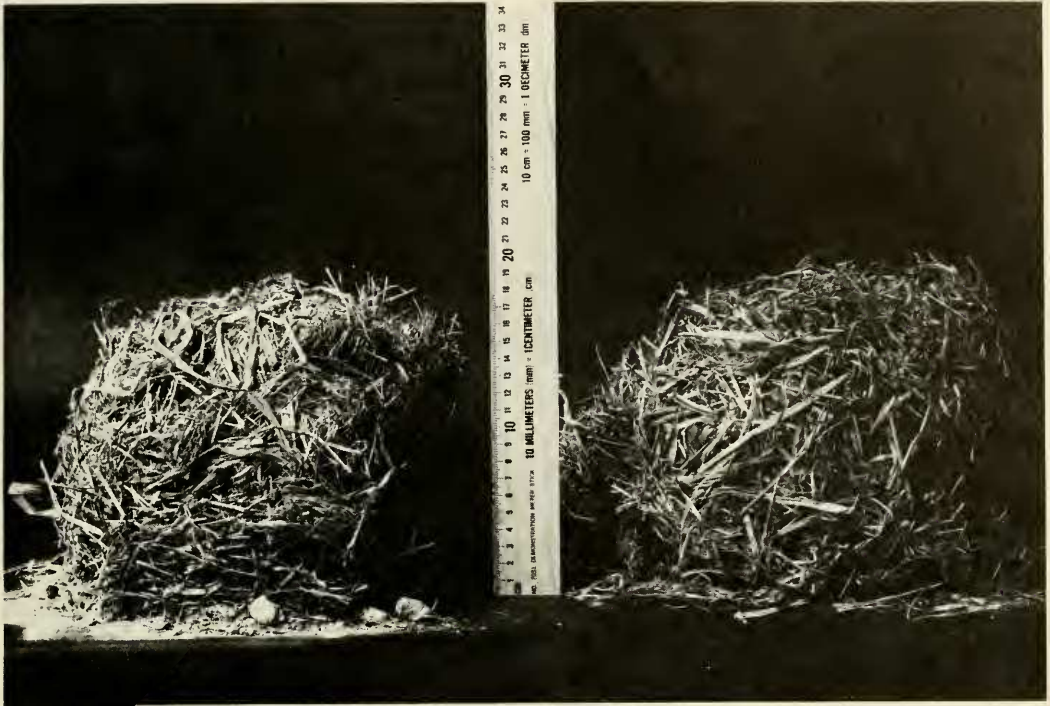


Fig. 2. Nests of the Utah prairie dog. Scale in mm (Photo by S. Baronh).

two individuals. All hibernating animals nested separately. The closest two occupied nests were about 1.2 m apart at approximately the same depth.

Of the 35 entrances shown in Fig. 1, 24 were active in 1978, but only about half of these led to main burrows. Other active entrances (e.g., 35, 10, 11, 33, 12, and 13) were to "emergency hiding" burrows. Old entrances 24-25 and 26-27 marked the ends of two such burrows that were active from 1972 to 1975 and then abandoned. Old entrance 34 originally led to a main burrow system and was used from 1973 to the summer of 1975, when heavy rains filled it with soil, and it was never reopened. Entrance 18 marked the location of the first burrow dug by the wild-trapped stock in 1971 and was the only entrance in continuous use for the entire history of the colony. It was also the entrance where the first young born to the colony emerged in 1973. Old entrance 32 was the only one known to have been opened by digging from below the ground to the surface. The tunnel leading from it was the most nearly vertical (estimated 80 degrees). Others entered the ground at a 25- to 40-degree angle.

Even though the samples were small, the burrows of Utah prairie dogs described here-in did not differ significantly from those of other whitetailed species. Although *C. leucurus* and relatives are usually regarded as true hibernators, there seem to be no consistent differences between the underground systems of whitetailed and the non-hibernating black-tailed prairie dogs. Some variations in burrow design apparently related to local soil, rock, and gravel strata conditions (Wilcomb 1954) or height of the water table and periodic flooding have been reported (Foster 1924; Whitehead 1927). Utah prairie dogs made no modifications to prevent occasional flooding of their burrows from heavy rains in Washington, D.C.

#### ACKNOWLEDGMENTS

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